Some Notes on Palms of the Genus Copernicia

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According to the revision of *Copernicia* by Dahlgren and Glassman (1961, 1963) there are 29 taxa of this genus in tropical America. A number of these have been studied in some detail because of their heavy cuticle wax production, or because they exhibited desirable characteristics for plant breeding experiments aimed at developing a better wax palm.

The carnauba wax palm *C. prunifera*, native of northeastern Brazil, is the only member of the genus which has been commercially exploited for its wax. This exploitation began early in the 19th century when carnauba wax was used for making candles. In the present century, as the wax became an important ingredient in floor polishes, demand increased and it became an important export item from Brazil.

The economic use of this palm was the subject of a recent unpublished thesis by the author entitled *The Carnauba Wax Palm (Copernicia prunifera) and Its Role as an Economic Plant.* This study concluded that establishment of the carnauba wax palm as a plantation tree crop in Brazil was feasible. Competition from synthetic waxes and polymeric resins, however, threatens to reduce further the international market for the wax.

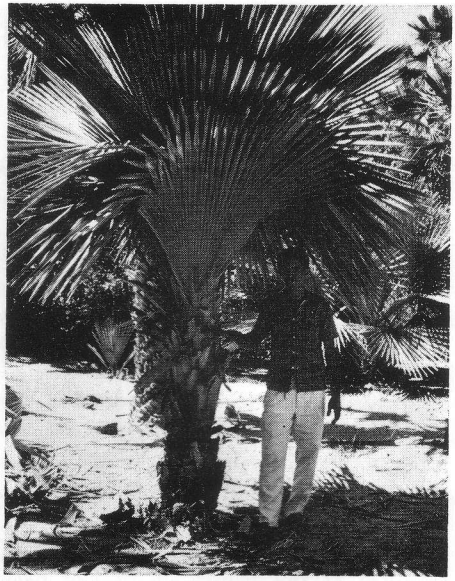
In the late 19th and early 20th centuries, the carnauba wax palm was introduced to Africa, Asia, and India, with the idea of establishing it as a plantation crop, after the successful example of rubber. Although the literature contains a number of references to such schemes, there is no record that the carnauba was planted outside botanical gardens or research stations. Somehow the belief that the wax production of the carnauba palm was a direct result of the semiarid climatic conditions in northeastern Brazil became "common knowledge." It appears that this belief was fostered by reports from botanical gardens outside Brazil that the leaves of their carnauba specimens did not have a heavy wax coat. Such reports were probably made because those examining the leaves were not aware of the necessary procedure of sun-drying the leaves, and then shaking or beating them to dislodge the wax particles.

In the 1950s E. D. Kitzke conducted research on mature carnauba palms at the U. S. Plant Introduction Garden, Coconut Grove, Florida. He found that wax yields of the specimens growing under the very humid conditions of southern Florida were comparable to those of the trees in their native habitat.

An extended botanical research project on *Copernicia* palms was carried out by the S. C. Johnson & Son, Inc. It involved field studies of the palms in their native habitats of Cuba, Brazil, and Paraguay, and the establishment of a research plantation for introduced species at Raposa near Fortaleza, Brazil. The termination of the project and donation of the plantation to the University of Ceará as a research facility was reported by Kitzke (1970).

A terminal report to summarize the research on *Copernicia* was prepared by the author. This included a physical inventory of the introduced palms in the

1. This specimen of *Copernicia Baileyana* at at Raposa is six meters in height and 18 years old, but has not yet reached botanical maturity.



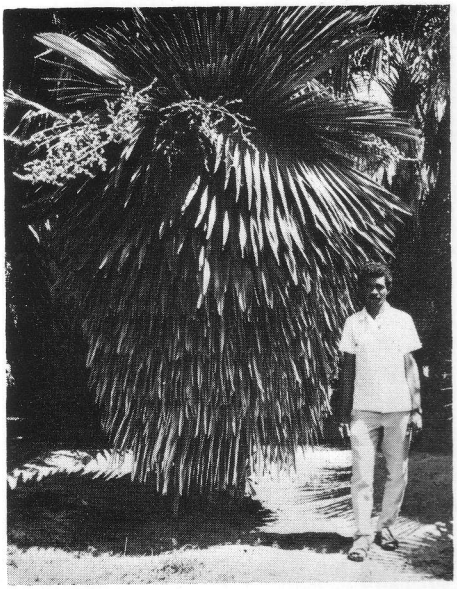
2. A 23-year-old *Copernicia rigida* at Raposa. Note characteristic cuneiform leaf blade.

Raposa collection. The results are presented in Table 1. Of the 14 taxa listed, all except *C. Baileyana*, *C. Burretiana*, and *C. rigida*, are represented by botanically mature specimens. It is expected that these last will shortly begin flowering as they are large well-established specimens (Figs. 1, 2). The specimens of *C. macroglossa* at Raposa (Fig. 3) are handsome palms and appear to have potential as ornamental plants within the semiarid tropical regions. The large number of specimens of *C. hospita* is indicative of its being the highest wax producer of the taxa studied; its potential as a commercial wax source was reported by Kitzke and Wilder (1961).

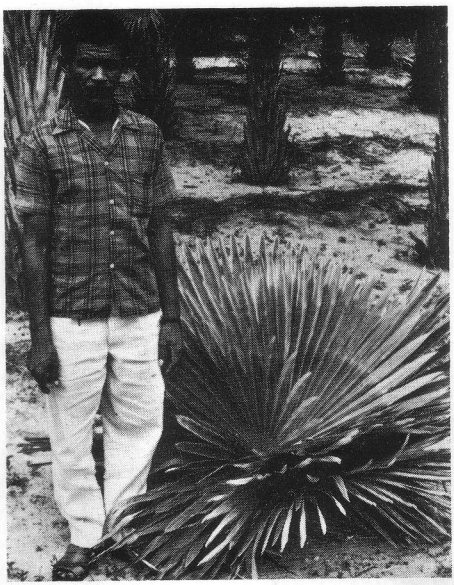
The Raposa collection poses some interesting botanical questions. Kitzke (1970) noted the natural hybrid *C.* × *Shaferi* and its segregation into three types in the F_2 generation: *C. hospita*-like, *C. Cowellii*-like, and an intermediate hybrid type (Figs. 4, 5, 6). From

TABLE 1. *Raposa Palm Collection as of July, 1970.*

Species	No. of Individuals
Copernicia alba	286
C. Baileyana	62
C. Burretiana	2
C. Cowellii	23
C. Curtissii	10
C. glabrescens	41
C. hospita	853
C. macroglossa	47
C. rigida	2
C. × *Shaferi*	28
C. tectorum	2
C. × *textilis*	14
C. × *vespertilionum*	2
C. Yarey	89
Total number of specimens	1,461



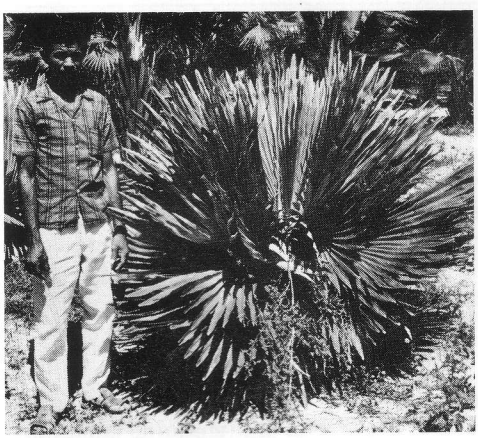
3. *C. macroglossa*, a most attractive ornamental. This tree at Raposa is 18 years old.

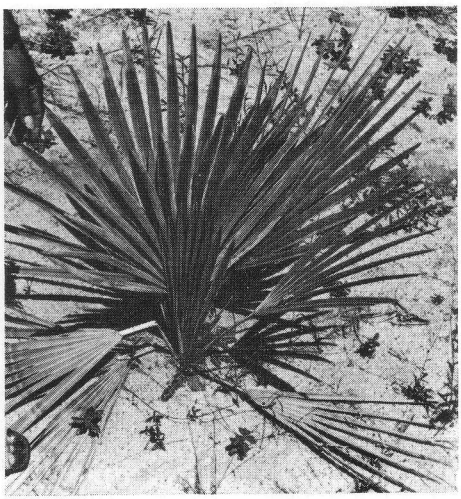


4. *C.* × *Shaferi*, a 16-year-old specimen at Raposa exhibiting *Cowellii*-type characteristics.

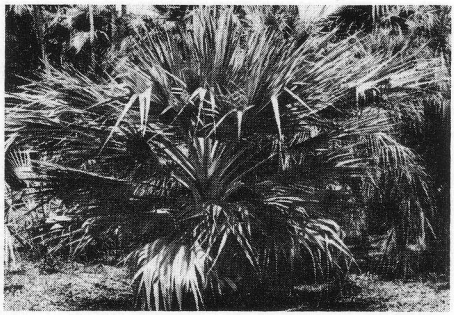
the recent survey it appears that the same segregation may be occurring with *C. Burretiana*, a suspected natural hybrid of *C. hospita* and *C. macroglossa*.

Another aspect of the author's terminal report on *Copernicia* research involved a short period of field study in Haiti of *C. Ekmanii* (Fig. 7). This species was selected because its described habitat is similar to that of several of the 12 Cuban taxa in the Raposa collection, and because travel to Haiti was without political complications.





5 (left). *C.* × *Shaferi*, another specimen of the same age, this is the "Cromo" hybrid type.
6 (right). *C.* × *Shaferi*, a *hospita*-type of uncertain age.



7. *C. Ekmanii*, a nine-year-old specimen at the Fairchild Tropical Garden.

The natural range of *C. Ekmanii* is described by Dahlgren and Glassman (1963) as in the vicinity of Port-au-Prince and in Haiti's northern peninsula. It is also reported that the leaves of the palm are used for making hats.

Attempts to locate specimens of *C. Ekmanii* around Port-au-Prince were unsuccessful. Information provided by those engaged in making and selling hats indicated that the palm is known by name in and around the city, but that it grows only in the northern part of the country. It appears, therefore, that *C. Ekmanii* has become extinct in one of its two former areas of distribution. Given the human population pressure on Haiti's meager natural resources, it may well become totally extinct in the present century.

The information here presented indicates the considerable attention *Copernicia* palms have received. With the published and unpublished data presently available to researchers, additional study of the botany and ecology of these palms could easily be undertaken.

Literature Cited

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